IN THE CLAIMS:

1. (Original) A tracking control apparatus for an optical disc which has wobble grooves as tracks, comprising:

a signal detection unit operable to detect a tracking error signal and a wobble signal from an optical spot focused on the optical disc;

a speed calculation unit operable to calculate, in a tracking-off state, a relative moving speed between the optical spot and the tracks, from (i) a zero-cross point cycle in the tracking error signal and (ii) a track pitch;

a polarity judgment unit operable to judge, by a polarity judgment, that the optical spot is on a land if a wobble signal amplitude value is equal to or lower than a predetermined value in vicinity of a zero-cross point; and

a moving direction judgment unit operable to, when the relative moving speed is within a predetermined range and the polarity judgment unit has judged that the optical spot is on a land, judge a moving direction of the optical spot relative to the tracks, from a rise/decay direction of the tracking error signal.

2. (Original) The tracking control apparatus of Claim 1 further comprising

a control unit operable to perform a tracking lead-in by reducing the relative moving speed, based on the relative moving speed calculated by the speed calculation unit and the moving direction, and

the moving direction judgment unit judges whether the optical spot is moving from an inner circumference track toward an outer circumference track or from the outer circumference track toward the inner circumference track, according to whether a differential

coefficient of the tracking error signal is positive or negative.

3. (Original) The tracking control apparatus of Claim 2, wherein

the control unit includes:

an eccentricity storing sub-unit operable to calculate an amount of eccentricity per rotation of the optical disc, from a moving speed and a moving direction that are calculated and judged by the speed calculation unit and the moving direction judgment unit based on the tracking error signal corresponding to one-half or more rotation of the optical disc, and to store data of the calculated amount of eccentricity;

a following operation sub-unit operable to cause the optical spot to follow a specific track among a plurality of eccentricity tracks crossing the optical spot, with timing when the specific track passes the optical spot, based on the amount of eccentricity stored in the eccentricity storing sub-unit; and

a first lead-in sub-unit operable to lead a tracking into the specific track or a track in vicinity of the specific track while the optical spot is following the specific track.

4. (Original) The tracking control apparatus of Claim 3, wherein

the specific track is approximately at a center of the plurality of eccentricity tracks.

5. (Original) The tracking control apparatus of Claim 2, wherein

the control unit includes:

an eccentricity storing sub-unit operable to calculate an amount of eccentricity per

rotation of the optical disc, from a moving speed and a moving direction that are calculated and judged by the speed calculation unit and the moving direction judgment unit based on the tracking error signal corresponding to one-half or more rotation of the optical disc, and to store data of the calculated amount of eccentricity;

a second following operation sub-unit operable to cause the optical spot to follow a track that is approximately at a center of the plurality of eccentricity tracks, based on the amount of eccentricity stored in the eccentricity storing sub-unit; and

a second lead-in sub-unit operable to, with given timing, lead a tracking into the track approximately at the center of the plurality of eccentricity tracks.

6. (Original) The tracking control apparatus of Claim 2, wherein

the control unit includes:

an amplitude calculation sub-unit operable to calculate a wobble signal amplitude of a land that is adjacent to a given point on a track of the optical disc, using a reference radius position of a wobble phase, a track pitch, a wobble length, a track number, and a rotation angle;

an amplitude storing sub-unit operable to store, as a measurement data sequence of wobble signal amplitude, moving directions that are judged by the moving direction judgment unit prior to a tracking lead-in at an end of a seek by restricting a moving speed of the optical spot to within the predetermined range; and

an error correction sub-unit operable to correct an error of a groove count value in a middle of a seek of an object track, according to a correlation between (i) a data sequence of wobble signal amplitude values for a plurality of lands crossed by the optical spot that are calculated by the amplitude calculation sub-unit from groove count values counted during the

seek of the object track and (ii) the measurement data sequence, using the calculated wobble signal amplitude value data sequence as a template.

7. (Original) The tracking control apparatus of Claim 2, wherein

the polarity judgment unit includes at least one of:

a first judgment sub-unit operable to judge that the optical spot is on a groove if a RF signal amplitude value from the optical disc is equal to or higher than a predetermined value;

a second judgment sub-unit operable to judge whether the optical spot is on a groove or a land based on total light quantity signals from the groove and the land of the optical disc if there is a difference between the total light quantity signals; and

a third judgment sub-unit operable to judge whether the optical spot is on a groove or a land based on total light quantity signals from the groove and the land of the optical disc if there is a difference between the total light quantity signals, excluding portions of the optical disc for which the RF signal amplitude value from the optical disc is equal to or higher than the predetermined value, wherein

the moving direction judgment unit further judges the moving direction of the optical spot relative to the tracks from the rise/decay direction of the tracking error signal if any of the first to third judgment sub-units judges by a polarity judgment whether the optical spot is on a groove or a land.

8. (Original) A tracking control method for an optical disc which has wobble grooves as tracks, comprising the steps of:

detecting a tracking error signal and a wobble signal from an optical spot focused

on the optical disc;

calculating, in a tracking-off state, a relative moving speed between the optical spot and the tracks, from a zero-cross point cycle in the tracking error signal;

judging, by a polarity judgment, that the optical spot is on a land if a wobble signal amplitude value is equal to or lower than a predetermined value in vicinity of a zero-cross point; and

judging a moving direction of the optical spot relative to the tracks from a rise/decay direction of the tracking error signal when the relative moving speed is within a predetermined range and it has been judged that the optical spot is on a land.

9. (Currently Amended) A tracking control program for causing a computer to perform a tracking control of an optical disc which has wobble grooves as tracks, stored in a computer readable medium, which when executed by a processor, causes the processor to perform ~~comprising~~ the steps of:

detecting a tracking error signal and a wobble signal from an optical spot focused on the optical disc;

calculating, in a tracking-off state, a relative moving speed between the optical spot and the tracks, from (i) a zero-cross point cycle in the tracking error signal and (ii) a track pitch;

judging, by a polarity judgment, that the optical spot is on a land if a wobble signal amplitude value is equal to or lower than a predetermined value in vicinity of a zero-cross point; and

judging a moving direction of the optical spot relative to the tracks from a

rise/decay direction of the tracking error signal when the relative moving speed is within a predetermined range and it has been judged that the optical spot is on a land.